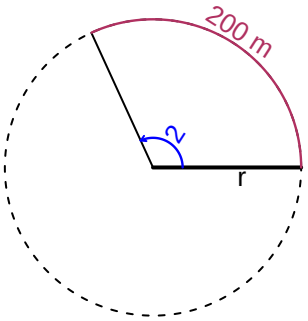
Name: Date:

# Trig Final (TEST v624)

- You should have a calculator (like Desmos) and a unit-circle reference sheet.

### Question 1

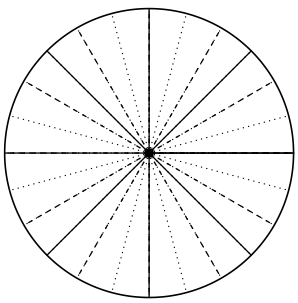
In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 200 meters. The angle measure is 2 radians. How long is the radius in meters?




### Question 2

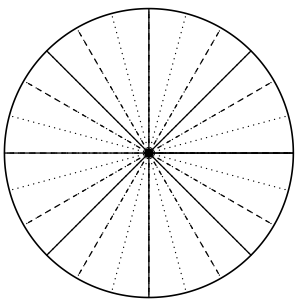
Consider angles $\frac{10\pi}{3}$ and $\frac{-11\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{10\pi}{3}\right)$ and $\cos\left(\frac{-11\pi}{4}\right)$ by using a unit circle (provided separately).

Mark $\frac{10\pi}{3}$



Find $\sin(10\pi/3)$

Mark $\frac{-11\pi}{4}$



Find $\cos(-11\pi/4)$

**Question 3**

If $\sin(\theta) = \frac{80}{89}$, and $\theta$ is in quadrant II, determine an exact value for $\tan(\theta)$.

**Question 4**

A mass-spring system oscillates vertically with an amplitude of 2.5 meters, a frequency of 5.03 Hz, and a midline at $y = -6.2$ meters. At $t = 0$, the mass is at the midline and moving up. Write an equation to model the height ($y$ in meters) as a function of time ($t$ in seconds).